Mõningad pakkumised kursusetöö teemaks

(Osad teemad pärinevad prof. Kewal K. Saluja’lt, University of Wisconsin)

Ajakirjade ja konverentsiartiklite andmebaasid:

- Citeseer: http://citeseer.ist.psu.edu/
- ACM Digital Library: http://portal.acm.org/dl.cfm
- IEEEXPlore: http://ieeexplore.ieee.org/ (kõik konverentsid ja ajakirjad, mille nimes IEEE)
- SpringerLink: http://www.springerlink.de/
- ISI Web of Science: http://isiknowledge.com/

Viimased neli andmebaasi (ACM, IEEE, Springer ja ISI) on kättesaadavad vaid TTÜ võrgust.
Väljastpoolt TTÜ võrku saab neid kasutada läbi TTÜ portaali: https://portal.ttu.ee/

Lisaks:

- Accident Databases: http://www.ntnu.no/ross/info/data.php#Accident
- Safety Critical Systems Virtual Library: http://www.afm.sbu.ac.uk/safety

Teemad

- Nov/Dec 2008 issue of IEEE Design & Test of Computers magazine dealing with reliability
- IEEE Transactions on Computing - Dec 2008 issue: deals with parallel applications
- IEEE Transactions on Computing - Jan 2009 issue: deals with nanowire decoders
- Architecture level fault-tolerance - see papers in IEEE Micro 41, ASPLOS 2008
- Reducing storage burden via data deduplication (IEEE Computer, Dec 2008, pp 15-17): its impact on fault-tolerance and compare with other methods such as data compression or mixing of data-deduplication and file compression.
- Output commit level fault-tolerance using Condor in combination with forward recovery (different from forward recovery through checkpointing)
- Fault tolerance in wired and wireless systems - for example use of network coding
Evolution of homogeneous systems into heterogeneous systems in the presence of faults and reconfiguration capability.

Nano tubes

RAID Levels, Architectures and Relative Performance

Numerous papers including a recent paper (see ref below) dealing with separable codes
- (Feng, Deng, Bao, and Shen, "New and efficient MDS array codes for RAID Part I: Reed-Solomon-Like Codes for Tolerating Three Disc Failures", IEEE Transactions on Computers, Sept 2005.)

Self Checking
- "state" checker based method
- Refs: ITC paper by Mitra in the conference Proc of 2000
- Special Issue of JETTA - August 2005 has two papers on this topic
- An annual conference "IEEE Online test conf" can be rich source of papers in this area.

Check pointing, Rollback, Roll-forward
- A some what recent ref is Ssu, Fuchs, and Jiau, IEEE TC Feb 2003

Routing and reconfiguration in systems with faulty nodes/links
- Aversky and Natchev, "Dynamic reconfiguration in computer clusters with irregular topologies in the ...", IEEE TC, May 2005

Fault tolerance in cellular networks
- Yang et. al "A fault-tolerant distributed channel allocation scheme for cellular networks", IEEE TC, May 2005

Crosstalk tolerant bus encoding schemes

Life span computation using multiple voltage and multiple frequency controls

Use of recursive redundancy to improve reliability
- IEEE Design and Test, Aug/Sep 2005

Fault tolerant methods in modern speculative processors

Comparative study of reliability and performance evaluation tools

Tandam/Compaq: Prepare a survey of the fault tolerance techniques of the Compaq NonStop Himalaya Servers.
- (expand it to widen the scope and include more recent products of various manufacturers of ICs and systems)

Fault tolerant in Automotive systems: Prepare a survey of fault tolerance techniques that are used in automobiles. Include systems like engine management, drive by wire and steer by wire.
- http://www.delphi.com/

- Fault-tolerant features of modern processors - compare and contrast you may look at the websites of Intel, IBM, HP, Sun, etc.

- Software Testing
- Tools and Demos of software testing -
  - The book by Lyu, "software reliability engineering" and many conferences and web should provide a rich resource

- Use of on-line testing methods in hardware fault-tolerance
  - There is an annual workshop that deals with this issues
  - "IEEE On-line testing symposium"

- Hardware defect tolerance
  - See many papers by Koren

- Fault detection techniques:
  - Signatures
  - Watchdogs
  - Assertions
  - Duplication

  o Memory protection codes

  o Current monitoring

- Fault tolerance techniques
  o Re-execution

  o Rollback recovery

  o Active and passive replication

  o Transparency

- Arriving agreement in interconnected systems - algorithm implementations and relative performances
- bio-computing, alternative technologies (such as high risk technologies)
- Quantum Computing
- Provide an alternative classification of software fault-tolerant techniques. Includes a survey of all methods such as classical methods (N version programming, recovery block) and methods more often used in practice such as checkpointing, shadowing, etc.
- Clock synchronization
- Atomic and reliable broadcast
- Algorithmic based fault-tolerance
- System level diagnosis - distributed algorithms
- Fault-tolerant transaction processing systems
- Measures of software reliability
- Validation and verification techniques
- Modeling and evaluation tools
- Fault injection methods
- Fault tolerance in wireless systems
- Fault tolerance and reconfigurable memory systems
- MEM based systems and fault-tolerance requirements
- Reconfiguration for fault-tolerance (use of FPGAs)
- Evaluation tools such as SHARP and USAN - compare and contrast

- Survey of rollback-recovery techniques in wired and wireless networks
- Fault tolerance in wireless systems
- A fault model for SETI-style distributed computing
- Reducing Cross-coupling effects using bit ordering
- Crosstalk aware fault-tolerant techniques
- Fault tolerance in modern operating systems
- Characterizing non-determinism in cores of future processors
- Fault tolerant techniques for on chip cache memory
- Routing in systems with faulty nodes/links
- Bio-inspired fault tolerance for cellular arrays
- Bit-sliced architecture for fault tolerance
- Software testing and verifiable system design
- Fault tolerant sensor network algorithms and techniques
- Fault Tolerant real-time systems
- Case Study: IBM S390 system - fault tolerance and availability
- On-line testing for fault tolerance
- Evaluating fault tolerant techniques for superscalar processors
- Fault-Tolerance in E-Commerce Web Servers
- Incorporating fault tolerance in reconfigurable architectures
- The fault-tolerant FFT butterfly network
- Extended life span testing
• Linux application fault tolerance
• Encoding for crosstalk tolerance busses
• Fault Tolerance in Automotive X-by-wire
• Survey of fault-tolerant techniques in modern micro-processors
• Fault-tolerance in Quantum Computing
• Performance and reliability analysis of RAID-based memories